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An Economic Survey of the Production and Marketing of Mangoes in Visakhapatnam District

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Introduction: Mango is eaten in forms, various from the fruitlet to the finished product, the points in its favour being its availability in seasons, an appetizing flavour, pleasing bouquet, luscious bulk and a high dietetic value as a source of vitamins. Yet its production is not commensurate with the demand and its importance and there seem to be no marked improvements in cultural practices and marketing methods. The existence of pre-harvest contractors in the place of growers, numerous intermediaries in marketing, imperfect merchandising, absence of market associations and the trade's dependence on external demand are the major problems that require consideration. Further, the low production from mango orchards in recent years points to lack of sufficient interest on the part of the growers.

Material and Methods: An investigation was conducted on the lines of the Central Agricultural Marketing Reports during a tour in the Circars in May 1949, and was supplemented by enquiries in subsequent years. Wherever possible official information is supplemented with local enquiries. The scope of introducing better methods of production and systematised market practices is examined, with relevant recommendations.

State Production and Trade: Mango is grown on an area of 2,50,000 acres, forming roughly 50% of the total extent under fruits in the Madras State. Its annual production is estimated at 8,00,000 tons, of which 2,000 tons are exported to other States in India. In recent years there is a downward trend of exports, due to various factors, the chief among them being inadequate wagon supply.

District Supplies: (a) *Acreage and its trends*: This district had an area of 36,140 acres in 1948–'49 (normal area 29,400 acres) being 14·58% of the total area under this crop, taking a second place in the State. The acreage shows a gradual increase upto 1935–'36, with a maximum of 46,575 in 1926–'27 and thereafter a decrease, reaching a minimum of 26,830 acres in 1938–'39. The former is attributable to the liberal assignment of porambokes at low rates during the early years, while the latter points to the wide destruction of aged orchards in later years. During the quinquennial period ending with 1938–'39, gardens on about 14,500 acres (35% of the average area) were removed and renovated with choice

varieties to an extent of 11,8000 acres (80% of the destroyed area). The climate and the red loamy soils of the tract are best suited for its extensive cultivation.

(b) *Propagation, classification and description of varieties:* In this district mango industry is chiefly in the hands of *Kshatrias:* who are tradionaly the pioneers in the trade and are responsible for the introduction and spread of a large number of choice varieties.

Among the varieties Swarnarekha leads with 50% followed by Banganapalli, Collector and Kolankagoa, each 10%, besides other types occupying 20%. According to the Marketing Report the first two occupy 40% and 20% of the area cultivated during the years 1935–'36 and 1936–'37. Of the area cultivated, about 20% is estimated to be under seedlings.

The varieties are classified locally according to the month of harvest, the normal season being April to June–July.

Class	Variety	Period of harvest.	
		Month.	No. of days.
1. Early	... Rajamanu, Chilakalamanu, Panikalamanu, Firangiladhva, and Parava ...	April	15
2. Mid	... Panchadarlakalasa, Cherukurasam, Nalla Andrews, Sannakulu, Swarnarekha, Banganapalli, Goa varieties and Baramasia	May–June	50
3. Late	... Kolankagoa, Collector, & Neelum ...	June–July	25

Of the above varieties not all are of commercial importance while those that claim inter-State recognition are very few, the chief among them being Swarnarekha and Banganapalli, which form about 65% of the trade in Visakhapatnam district.

The characteristics of the commercial varieties classed on the basis of size are detailed below:—

I *Large Fruits:* (Weighing 12 to 16 ounces and over)

SWARNAREKHA: Yellowish orange, flushed with crimson colour–oval shape–soft fruit–pleasant flavour and sweet taste early season and fairly regular and heavy yielder–a table and juicy variety of poor keeping quality.

BANGANAPALLI: Lemon yellow colour–long or bulged shape–hard fruit, pleasant flavour and sweet taste–mid season and moderately regular, heavy yielder–table variety–good keeping quality.

COLLECTOR: Lemon yellow to yellowish orange colour – rectangular or slightly reniform shape with curved beaks – ripens unevenly – aromatic flavour and taste varying from sour to sweet – mid to late season and moderately heavy yielder table variety and keeping quality good to medium.

II *Medium Fruits:* (Weighing 6 to 12 ounces)

NEELUM: Orange yellow colour – oval or slightly reniform shape with curved beaks – moderately hard fruit – pleasant flavour and sweet taste – late and off-season and moderately regular, heavy yielder – table variety and good keeping quality.

KOLANKAGOA: Light yellow colour – oval, with a rounded and slighly extended base – hard fruit – delicate, aromatic flavour and moderately sweet taste – late to mid season and heavy yielder – table and pickle variety – keeping quality medium-

III *Small Fruits:* (Weighing 6 ounces and less)

RAJAMANU: Lemon yellow colour – oblong and slightly reniform shape – soft fruit with abundant juice – pleasant flavour and medium sweet taste – early good yielder – juicy variety – keeping quality medium to poor.

(c) *Production:* Graft mango gardens commence bearing at the age of 5 years and attain full bearing capacity from the 10th year tending to decline after 20 years and cease to bear after 40 years. There are however plantations as old as 80 years but usually 40 to 50 year-old groves are uneconomical. Naturally the limits fixed vary according to variety, soil and climatic conditions, culture of the groves etc.

The distribution of groves according to the bearing periods as observed in Visakhapatnam district is as follows:

Orchard stage	Bearing period in years	Area in acres.	% to the total	Estimated per tree No. of fruits	Normal yields per acre Imperial maunds
1. Young	... 5 & below	11,793	32·7	No yields.	
2. Bearing:					
a. Early	... 6 to 9	7·190	19·9	80	28
b. Prime	... 10 to 20	4.270	22·1	200	70
c. Old	... 21 to 25	3,730		150	52
d. Aged	... Over 25	9.060	25·4	100	?
Total for the district.		36,140	100·0	Average.	49·25

In the absence of performance records it is difficult to assess the yields with any accuracy.

In general a ten-year old tree bears 300 to 500 fruits in years of heavy bearing and frequently mature trees 1,000 to 1,500 fruits, but the average over a period of years would seldom approach

that figure. The average calculated over the bearing period as revealed by the present enquiry works out to 135 fruits per tree per year, with an annual production of 37,280 tons in this district. This estimate nearly agrees with that of Balakrishnamurthy and Jogiraju, who put the average at 100 fruits per tree in a year and that of a fairly good crop at 200 to 300. According to the Marketing Report the same is estimated at 146,887 tons i.e. 4 tons per acre or about 320 fruits per tree. Since non-bearing orchards constitute nearly a third of the area, this estimate seems to be rather high. The decline in yields in recent years is attributed partly due to the harvest of immature fruits to meet the increasing demand for exports.

(d) *Trade :* The producing areas distributed all over the districts form a natural grouping into four primary zones :— Alamanda, Anakapalli, Narasapatam and Vizianagaram. These zones are also principal exporting markets as almost all the produce reaches the market from the neighbouring places of production,there being no major exporting centres in Srikakulam district (formerly North Visakhapatnam) since the supply caters mostly to local demand.

The following table shows the flow and periodicity of supplies in a year. The peak period is May – June and the slack months are April and June – July, the length of the season being taken as 90 days.

Production and exporting centre	Seasonal production Daily estimated average in imp. maunds			Remark.
	Peak	Slack	Total	
a. Alamanda ...	2,000	1,000	3,000	Of this quantity 75 to 80% is available for export to other States and therest is utilised for home consumption 18 to 15% as fruit (including pickle) and the remaining for dehydrated pulp *(Thandra)*
b. Anakapalli ...	1,800	700	2,500	
c. Narasapatam ...	1,000	500	1,550	
d, Vizianagaram ...	300	200	500	
e. Other producting areas. ...	1,500	500	2,008	
Total ...	6,600	2,900	9,500	

Note :— The consuming centres outside the State where the produce finds market are :-

Calcutta, Kharagpur, Midnapur and Asansol in West Bengal ; Delhi ; Amritsar in Punjab (Ind.), Lahore in Punjab (Pak.); Berhampur, Cuttack, Puri, Badrak, Balasore and Sambalpur in Orissa; Tatanagar, Chekdharpur, Ranchi and Ramghar Town in Behar ; Raipur, Nagpur, Katni, Bilaspur in Madhya Pradesh, and Hyderabad (Deccan).

The seasonal fluctuations, however, affect the flow of supplies. Damage due to mango hoppers, wind and hail storms is quite considerable, amounting upto 80%, depending on the intensity of the attack.

Demand: The demand for mangoes is universal from all classes of people. The home consumption in this district for an average family may be approximately 100 to 150 fruits as pickles, and about 150 to 200 fruits as fruit for the season and the per capita consumption may be about 25 to 50 fruits every year. Of course this varies very widely according to the individual purchasing power, depending on the prevailing price in the season. The demand for pickle variety is more during the months of April – May, while for dehydrated pulp it extends all over the season, damaged fruits and rejects being mostly used for that purpose. The total home consumption in the district is approximately 20,000 tons a year on the basis of population with due allowance for infants, invalids and the extremely poor.

The external demand is heaviest in the months of May – June, though it starts from April and extends to even July. Raw mangoes (fruitlets) are also in demand during January – February and dehydrated pulp during August to October. Exports to meet the demand from other States are effected to a large extent, while internal demand suffers in years of low production. From the seemingly inelastic demand, it would appear that the grower could dominate the trade, but actually he does not.

Prices: (a) *General:* No official publication of the prices in the different markets is available. Recently the Monthly Digest of Economics and Statistics of the Madras State started in 1950 gives the wholesale prices for the markets in the State and for this district the prices at Vizianagaram market are reported. In the absence of regular accounts of the grower's business and with the available scanty records maintained by the contractors and traders no easy appraisal of the prices or their annual and seasonal fluctuations is possible.

(b) *Orchard prices of standing crops:* Much speculation arises in fixing these prices and the contractors generally take into consideration the following factors:—

(i) Age and production capacity of the orchard,

(ii) Extent of flowering or bearing in the season,

(iii) Location of the orchard, availability of cheap labour and facilities for transport and marketing,

(iv) Expenditure for watch from sale to picking, and

(v) Extent of competition among the contractors.

The prices vary from Rs. 70 to 100 per acre depending on the condition of the orchards. The range in prices from year to year is more less influenced by the seasonal factor and the performance of the groves, it being anything from 5 to 10%.

(c) *Wholesale prices:* Since these prices are determined on the basis of available supplies and the external demand, the internal market has the least influence. As such the market rate in the producing areas is ruled by the merchants of other States and commission agents. Since the marketable produce is a perishable commodity dependent on the customary external market, the wholesale price has not much relationship to the production of the season though it is observed that prices tend to be high in years of low bearing. The main factors influencing the wholesale price are therefore:—

(i) External demand, (ii) early supply in the market and (iii) variety or quality of the produce.

The general behaviour of prices remain almost the same between years, though fluctuation is observed during a season. The current wholesale prices for the different commercial varieties are given in the following table:—

Variety	Wholesale rate per 1000 in the season			Remarks.
	April-May	May-June	June-July	
	Rs.	Rs.	Rs.	
a. Neelum ...	...	30	25	1,125 fruits are counted for
b. Kolankagoa ...	...	40	30	1,000 to allow for the damaged
c. Collector ...	...	60	50	and unripe ones.
d. Swarnarekha ...	70	65	...	
e. Banganapalli ...	100–80	...	...	

Note: The market for a season opens with a high price when the supplies just commence, shows a downward trend during the progress of the period when the market is in full swing being flooded with most choice varieties and tends to rise towards the close of the season with the few late types.

The variety-war fluctuations and weekly trends of the wholesale prices in a season during the three years 1944—'46 are studied. (Vide appendix). Variation in the different markets for the same kind and quality in a year is influenced by the following factors:—

(i) Available supplies and demand,

(ii) Location of the exporting market,

(iii) Transport facilities (both by road and rail), and

(iv) Market charges etc.

(d) *Retail prices:* The retail price is influenced by the wholesale rate prevailing at the place of production. The fruits are sold by the retailers on the basis of number, and the rate paid by the consumer varies considerably.

(e) *Market intelligence :* The growers are out of the picture and the contractors are indifferent about the customers' requirements, while the commission agents or the exporters form the link between them and the merchants of the other States. Merchants from other States or their agents come and reside at the market place during the season doing business through commission agents. The representatives are advised either by wire or letter intimating their local market rates and demand. Based on such instructions, exports are effected. There is no other means of disseminating market news to the growers or contractors. This naturally leads to much exploitation by the outside merchants and warrants better organisation.

Preparation for the market, grading and standardisation : No grading or standardisation is adopted save that of hand grading according to the size and variety, rejecting the damaged ones. Variety forms a natural basis for quality grading in mango. Limiting the varietal variations in mango by propagational methods serves the purpose of standardising the quality. This being important to growers as well as consumers, the wholesalers are usually influenced by the following features in selecting their fruit for their consignments :—

(a) External appearance : Stage of maturity, colour, size, shape, freedom from surface blemishes and mechanical injury.

(b) Fruit quality : Abundance of pulp, free from fibre, good flavour and taste.

Processing is not practised except ripening the fruit by packing the produce loose in bamboo baskets with a lining of straw. Tissue wrapping and packing the fruit in wooden ventilated crates of 2′ x 1′ x 1′ with a lining of soft material such as grass, straw etc., is desirable and economical as the losses on account of packing in bamboo baskets is as high as 15%. The boxes may be made returnable to save packing and forwarding charges.

Assembling and distribution : A number of intermediaries are engaged In assembling the produce to the distributing market consisting of various categories with numerous functions. The methods involved are as follows :—

(i) Growers sell their standing crop during January to March to pre-harvest contractors because of the difficulty in marketing and also of the unwillingness to take up the risks involved. It is a forward contract and the transaction is settled on payment of an advance ranging from 10 to 50% of the lease value as mutually agreed upon, watch, harvest and handling charge being borne by the contractors which amount to Rs. 45 per acre (Re. 1—0—0 to 1—4—0 per imperial maund).

(ii) Contractors take the place of growers and undertake supply of the produce to commission agents or exporters.

(iii) Commission agents purchase fruits from either contractors or growers.

(iv) Market organisations : Private Fruit Growers' Association and Fruit Merchants' Association (Registered) both of which are now not functioning properly.

The agencies and the methods of distribution are as under :—

(a) The fruits pass several hands before actually reaching the consumer.

(b) Growers do not undertake distribution usually. Of late some are engaged in doing their own business acting as exporters.

(c) Contractors form an important link supplying the fruit and receive advances from commission agents and also do retailing.

(d) Commission agents take up the essential function — the wholesale distribution of the produce. Retailing is done to a certain extent.

(e) Agents or representatives of merchants of other States reside at the place of production in the season and advice exporters regarding their requirements. The exporters despatch consignments and bill the packing and forwarding charges, besides freight and incidentals.

(f) Retail distribution is done by stall holders, hawkers and street vendors (usually contractor's family members) selling the fruit by roadsides or from door to door.

Market charges : Thatched sheds of 10′ x 10′ costing about Rs. 150, with a third of the value being realised at the close of the season, forms the main place of transacting the business. *Kalasis* (regular labour) on monthly basis at Rs. 30 to 50 are engaged for the season (3 months) depending on the skill and experience of the person. For a daily average exportable business exceeding two wagon-loods eight *kalasis* are engaged. Some *kalasis* work on daily basis at rates ranging from Rs. 1—8—0 to 2—0—0 ; these are mostly extra hands doing piece-work and find employment when there is heavy rush of fruit in the market.

The fruits received at the market-place through the different agencies are purchased and sold according to quality and size and paid for at the prevailing market rate. Open sale by sample and price fixation by mutual negotiation on satisfaction of the sample are usual ; the fruit being supplied on confirmation of the rate.

Exporters or commission agents receive remuneration for purchase, packing and forwarding, the commission varying from As. 6 to 8 per maund of the consignment. In the case of those who do their own business of forwarding etc., the commission paid to the merchant at the other end ranges from As. 10 to 12 per maund of the imported fruit.

Market tolls at the rate of one anna per maund and As. 6 per cart load (20 to 25 maunds) for produce received from outside the panchayat or municipal limits are collected. Handling, transport and forwarding charges on the basis of equal expenses are collected along with the value of the produce, which work out to roughly As. 12 per maund besides other misellaneous charges like *mamools*, etc.

Tho spread of prices and the allocation of the consumer's rupee among the various agencies including the grower is as given below :—

Agencies at the different stages.	Share of the consumer's rupee.
I. Production Centre :–	
Orchard owner	0–7–0
Orchard purchaser (Contractor) ...	0–1–0
II. Export Centre :–	
Incidentals including, packing, freight etc.,	0–3–6
Commission to the exporter ...	0–1–0
III. Importing or Consuming Centre :–	
Incidental charges	0–0–9
Middlemen or Commission agent ...	0–0–9
Margin to the merchant of the other State	0–2–6
Total ...	1–0–0

Handling and Transport: Under the existing methods of handling the fruits are liable to injury at every stage in the process of marketing, although fruits are picked with care, using poles with ring-nets to prevent damage.

On the basis of distance traversed and the mode of conveyance used (headloads, *kavidis* and carts) the charges incurred on an average work out to As. 1 to 2 per mile per maund subject to a maximum of As. 3 to 6 irrespective of lead and the mode of transport.

Ordinarily carts drawn by men are used for moving the produce to the railway station and lorries to places outside the district and to neighbouring railway stations; to get over the booking restrictions when there is rush of exports and difficulty or competition in the timely supply of wagons at the place of export. Fresh fruits are classified under railway risk and owner's risk for despatch by goods in wagon loads under Class 3 and 2 respectively

and charged at different rates. In the case of consignments for despatch per parcel trains the goods are charged at quarter parcel-rates.

The mango baskets, about 250 maunds are loaded in layers one over the other within the space of the wagon (wagon capacity 17 to 22 tons), so much so the bottom layers get the entire pressure of the consignment and the fruits get subjected to considerabls damage. It is therefore suggested that the wagons might be designed with racks inside having a clearance space of 4′ with a width 3′ on the sides and provided with air-conditioning if possible.

Storage and preservation: As the produce finds immediate disposal no arrangements are needed for storage except protecting the fruit in transit and at exporting markets from the severity of the sun as instances are not uncommon of consignments awaiting clearance at railway stations and market places for about a week. Cold storage as a means of long distance exports were tried in Bombay but none of the varieties in this tract stand cold storage satisfactorily, because of chilling effects at low temperature.

Summary and Conclusions: A discussion of the factors affecting the production and marketing of the mango in Visakhapatnam district reveals the importance of its culture as the premier marketable commodity under fruits.

The total area in the district is 36,140 acres which is 14·58% of the total area in the State, with an annual production of 37,280 tons. The producing areas form a natural grouping into four primary zones, which are also incidentally the principal exporting markets. Of the consuming centres outside the State, Calcutta forms the chief market for Vizag produce closely followed by Nagpur. The annual exports to other States amount to roughly 28,000 tons. Of the chief commercial varieties Swarnarekha and Banganapalli form the bulk of the trade.

The estimated home consumption is about 20,000 tons with a per capita of 20 to 50 fruits a year. There is a steady demand from North India for raw mangoes (fruitlets) during January – February, ripe fruits in May – June and for dehydrated mango pulp (*thandra*) between August to October.

There is at present no proper agency to spread market intelligence among the producers and traders. The prices in the producing areas are fixed and ruled mostly by the merchants of other States and the local businessmen are at their mercy.

In the process of assembling and distribution of the produce, the producers play a less significant role, there being a number of intermediaries. The producer's share in the consumer's price is

only seven annas in a rupee. Financial help to contractors and exporters narrows the limit of competition among buyers and ultimately affects the producers' price. The methods and costs of transport (both by road and rail) show certain inherent difficulties and limitations by way of booking restrictions, inadequate wagon supply, unsuitability of the present steel wagons, spoilage in handling etc. Absence of unequivocal methods to fix the proper stage of maturity for picking, imperfect ripening methods and crude methods of packing lead to much damage and pilfering in transit.

Recommendations: There is scope for improvements in the mango industry and trade on the following lines :—

(i) Replacement of seedling-propagated, uneconomic and aged gardens by grafts of known performance and commercial importance.

(ii) Improving yields by proper cultural practices to promote regular bearing, besides taking timely precautions to prevent damage due to pests and diseases.

(iii) Exploring new external markets for exports.

(iv) Maintenance of performance records for individual orchards.

(v) Stabilisation of prices may be aimed at by :—

  (a) Fixing ceiling and floor prices for the commodity.

  (b) Organising a bureau of market intelligence for disseminating market news to traders.

  (c) Inducing growers to organize a multipurpose co-operative society so as to eliminate the disproportionate margins of the intermediaries.

(vi) Establishing regulated markets and licencing the traders in order to ensure controlled and systematised marketing.

(vii) Improving the quality by proper selection of varieties, and adopting grade specifications and standardisation of containers and packing, notifying the number and weight of fruits in the containers, for each variety as a grade standard.

(viii) Minimising the damage and losses in transit by introducing returnable, well–ventilated crates in the place of the crude bamboo baskets, and by improving the design and type of the wagon by providing shelves to release pressure due to basket piles, and air-conditioning to regulate inside temperature.

(ix) Utilisation of the unexportable or surplus fruits by establishing small-scale canning units in the main producing centres.

(x) Scope for investigation and improvement of the dehydrated pulp industry; as at present it is in its crudest form.

(xi) Evolving new types that give more regular and earlier yields.

(xii) Research to increase the bearing capacity in off-season varieties.

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APPENDIX

Statement showing the price trends in a season for the important commercial varieties of mango in the tract for three years

Variety	Year.	Average price (wholesale) per 1000 fruits in rupees, Weeks in the months of											
		April				May				June			
		I	II	III	IV	I	II	III	IV	I	II	III	IV
Swarnarekha	1944	...	68	55	44	35	29	...	...	...	...	...	...
	1945	...	...	...	...	...	...	...	45	...	...	...	...
	1946	...	100	100	62	...	45	56	55	...	...	...	...
Banganapalli	1944	...	...	...	39	32	30	...	...	...	...	...	...
	1945	...	...	...	...	...	...	...	58	...	...	...	...
	1946	...	...	...	...	...	...	55	57	...	...	...	...
Kolankagoa	1944	...	...	...	...	...	19	...	...	...	...	...	...
	1945	...	...	...	...	...	...	...	46	...	...	...	...
	1946	...	...	...	...	...	...	43	...	...	...	...	...
Collector	1944	...	...	...	30	22	21	...	...	...	...	...	...
	1945	...	...	...	...	...	...	...	45	...	...	...	...
	1946	...	...	...	...	...	...	41	44	49	...	...	...
Miscellaneous varieties.	1944	...	...	...	...	...	...	20	...	...	...	...	...
	1945	...	...	...	...	...	...	...	42	...	...	...	...
	1946	...	41	43	...	...	40	...	...	...	...	...	...

(Collected from the records of the exporters.)